Numerical simulation of chemical EOR processes

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Stellingen

behorende bij het proefschrift

Numerical Simulation of Chemical EOR Processes

van

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1. One of the most common sources of error and confusion in science is copying references without verifying the accuracy of the reference information itself.

2. Reservoir simulation is a powerful tool, capable of saving considerable amounts of time and money when testing chemicals at a reservoir-scale. However, the oil & gas industry should also focus its research on a correct reservoir characterization, since the current resolution scales in determining size and properties of oilfields were long ago widely outsurpassed by the computational capabilities and methods (Chapter 2).

3. The viscoelasticity exhibited by polymer solutions plays a major role in the sweeping efficiency (Chapter 3). Nevertheless, it is important to also consider the interfacial viscoelastic effects, which influence the recovery process as well.

4. The flux-splitting scheme adopted to solve the hyperbolic terms of the mass transport equation proved to be a simple, yet ideal technique in order to noticeably decrease the appearance of numerical diffusion and dispersion phenomena (Chapter 4).

5. The degradation of polymer molecules is a phenomenon that cannot be neglected in any way. Its influence on both the viscosity and viscoelastic properties affects significantly the sweeping efficiency (Chapter 5).

6. In case of combined chemical flooding, it is crucial to understand the synergy of the EOR agents being injected and how their joint presence affects the physical properties of rock and fluids (Chapter 7).

7. Nanotechnology and its amazing main features (Thanks Feynman!) can also be used as a mean to improve the recovery in mature oilfields. Its combination with standard EOR techniques to boost the production presents a great potential, and it should be further investigated at larger scales (Chapters 8 to 10).

8. The propositions of every PhD candidate should be used to mention our small and humble contribution to science, and not merely as a mean to praise ourselves and negatively comment on what previous researchers did. After all, Newton stood up on the shoulders of giants, he did not criticize them.

9. A PhD is a long and hard journey, like a quest for a treasure or self-discovery. Its path is full of moments of satisfaction and joy, yet difficult times when it seems the mountain we are trying to conquer is impossible for our skills. For these moments, there is nothing like a good set of speakers, nice music and the best officemates ever to transform any Everest into one of the dutch "mountains".

10. You can say of yourself that you start to master and understand a certain topic when you are able to find several ways to explain it in simple terms.

11. Teaching is one of the most rewarding and complex experiences. It is often forgotten that it is not just telling, but it involves explaining and demonstrating... And more important, teaching is about inspiring!

12. In numerical simulation and computational sciences, one should always remember that in theory, there is no difference between theory and practice, whilst in practice there is.